This Datasheet for the

IC697CPM790

GMR Redundancy CPU, 486, 2K Triplex (voted) I/O.

http://www.cimtecautomation.com/parts/p-14778-ic697cpm790.aspx

Provides the wiring diagrams and installation guidelines for this GE Series 90-30 module.

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64 MHz, 32-Bit Floating Point Central Processing Unit, 1 Mbyte Memory, for IC66* Triple Modular Redundancy Systems

Features

- Single slot CPU
- Provides 1 Mbyte of battery-backed memory in the same slot (up to 512 Kbytes available for use by ladder diagram application program)
- Supports floating point calculations
- Up to 12K discrete inputs and outputs (any mix - simplex mode only); 2048 voted discrete inputs, 2048 voted discrete outputs
  Up to 8K analog inputs (simplex mode only) and 8K analog outputs (simplex mode only); 1024 voted analog inputs
- 0.4 microseconds per boolean function
- 64 MHz, 80486DX2 microprocessor
- Supports IC660/IC661 I/O (and IC697 I/O in simplex mode only)
- Programmed by MS-DOS®, or Windows® software products running on Windows® 95 or Windows NT® over Ethernet TCP/IP or through the SNP port.
- Configurable data and program memory
- Battery-backed calendar clock
- Three position operation mode switch
- Password controlled access
- Remote programmer keyswitch memory protection
- Four status LEDs
- Software configuration (No DIP switches or jumpers)
- Reference information inside front door
- In-system upgradable firmware

Functions

The CPM 790 is a single slot programmable controller CPU which allows floating point calculations. The CPM 790 is programmed and configured with MS-DOS or Windows based programming software for use in Emergency Shut-Down (ESD), fire and gas, and other critical control applications. It communicates with I/O and smart option modules over the rack mounted backplane (IC697CHS750, 782, 783, 790, 791) by way of the VME C.1 Standard format.

The CPM 790 must be used in conjunction with a Standalone C program which provides Triple Modular Redundancy (TMR) operating and autotest routines. It will not operate unless this program is included in the loaded application program.
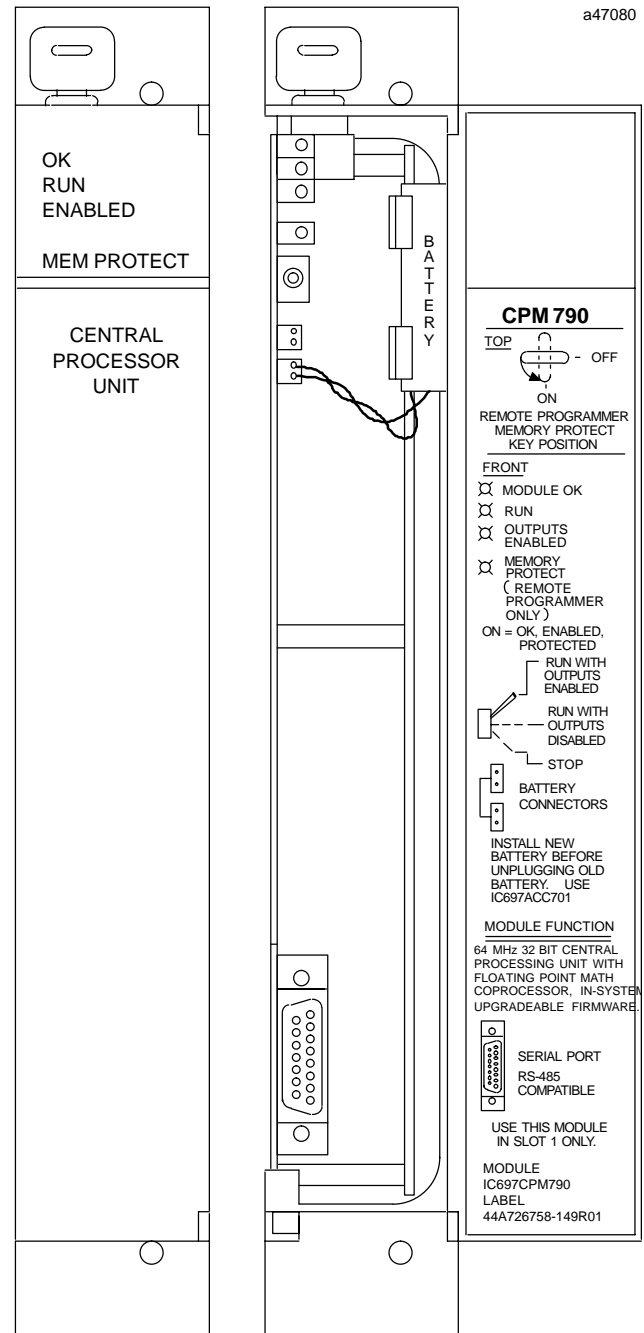
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For detailed information on TMR systems, see Reference 4, the IC66* *Modular Redundancy Flexible Triple Modular Redundant (TMR) System User's Manual.* Supported option modules include IC697 LAN Interface modules, Programmable Coprocessor, Alphanumeric

Display Coprocessor, Bus Controller for IC660/661 I/O products, Communications modules, I/O Link Interface, and all of the IC697 family of discrete and analog I/O modules.
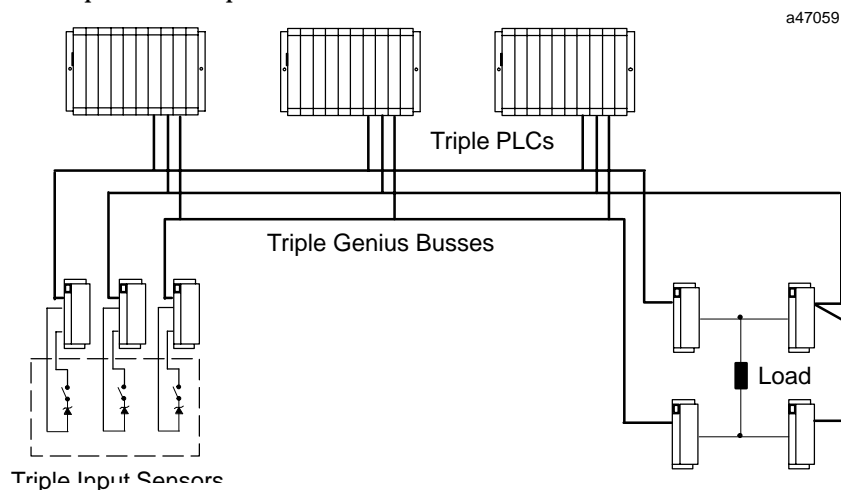
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Figure 1. Typical GMR System Configuration

User Memory

Program and data memory for the CPM 790 is provided by a memory board with 1 Mbyte of battery-backed CMOS RAM. *512 Kbytes of this memory is available for the user's application program and data.* This memory board is an integral part of the CPM 790 module and is included with the module.

Flash Memory

This module uses flash memory for storage of the operating system firmware *(this module does not support storage of user program in the flash memory).* This allows updates of the firmware without disassembling the module or replacing EPROMs. The operating system firmware is updated by connecting a PC compatible computer to the module's serial port and running the Loader software included with the firmware floppy disk.

Operation, Protection, and Module Status

Operation of this module can be controlled by the three-position RUN/STOP switch or remotely by an attached programmer and programming software. Program and configuration data can be locked through software passwords or manually by the memory protect keyswitch. When the key is in the *protected* position, program and configuration data can

only be changed by a programmer connected parallel only (to the Bus Transmitter module). The status of a CPU is indicated by the four green LEDs on the front of the module.

Operating Temperature

The CPM 790 requires forced air cooling for proper operation in ambient temperatures greater than 40°C (104°F). A fan capable of 70 CFM (including filters) should be located beneath slot 1 of the rack containing the CPU.

Fan assemblies (IC697ACC721, IC697ACC724, and IC697ACC744) can be ordered for direct mounting on the IC697 rack. Refer to the applicable *Programmable Controller Installation Manual* for detailed information.

Installation

It is the responsibility of the OEM, system integrator, or end user to properly install the PLC equipment for safe and reliable operation. Product manuals provide detailed information about installation, startup, and proper use of the PLC equipment. The installation manual, shipped with your PLC programming software, describes how to properly install the equipment. If the PLC installation must comply with supported standards, such as FCC or CE Directives, please refer to the *Installation Requirements for Conformance to Standards,*

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shipped with the PLC programming software, for additional guidelines.

- Installation should not be attempted without referring to the applicable *Programmable Controller Installation Manual.*
- Connect the battery to either of the battery connectors on the module (see Figure 2).
- Put the toggle switch in the STOP position.
- Put the keyswitch in the *Memory Protection OFF* position.
- Make sure that rack power is off.
- Install the CPM 790 module in slot 1 of rack 0.
- Turn on power.

The module should power up and the top LED should blink. When the diagnostics have completed successfully, the top LED stays on and the second and third LEDs are off. The fourth LED is off if the keyswitch is in the OFF position. The CPU is now ready to be programmed (if connected parallel, the CPU can be programmed regardless of key position). After the program has been verified the toggle switch can be moved to the appropriate operation mode position. The LEDs indicate the position of the toggle switch, memory protection status, and the state of the program.

Programmer Connection, Parallel

For a parallel interface (MS-DOS programmer only) the programmer is connected to the top port on the Bus Transmitter Module (IC697BEM713). Consult Reference 1 for a description of programming functions.
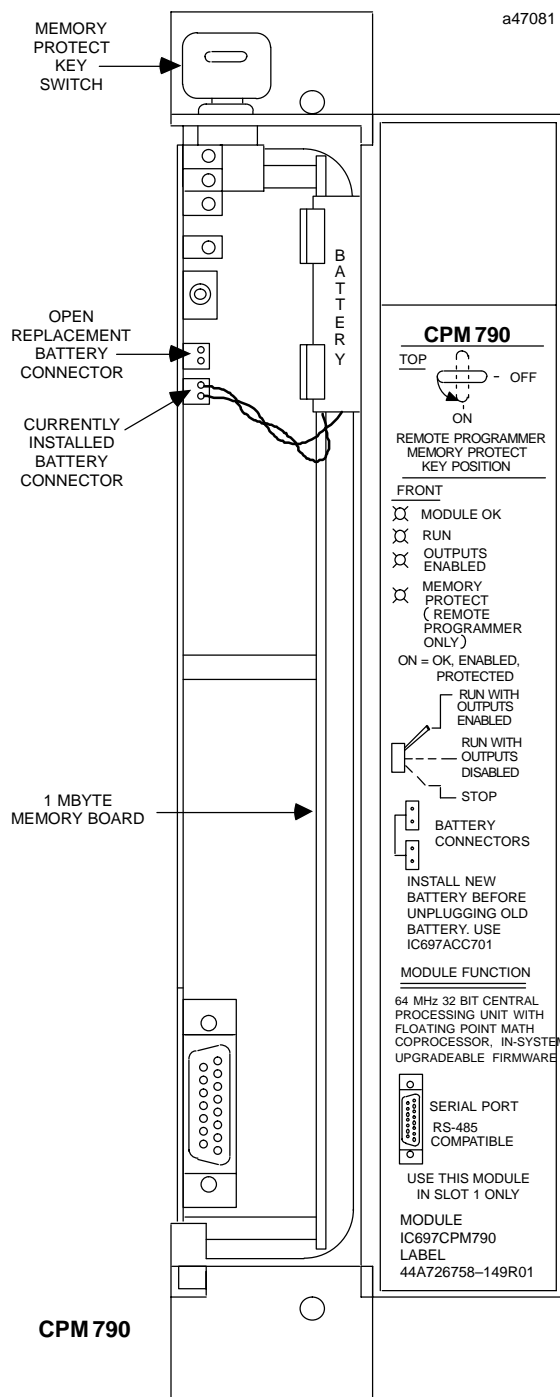

Figure 2. CPM 790 - Location of Major Features

**64 MHz, 32-Bit Floating Point Central Processing Unit,
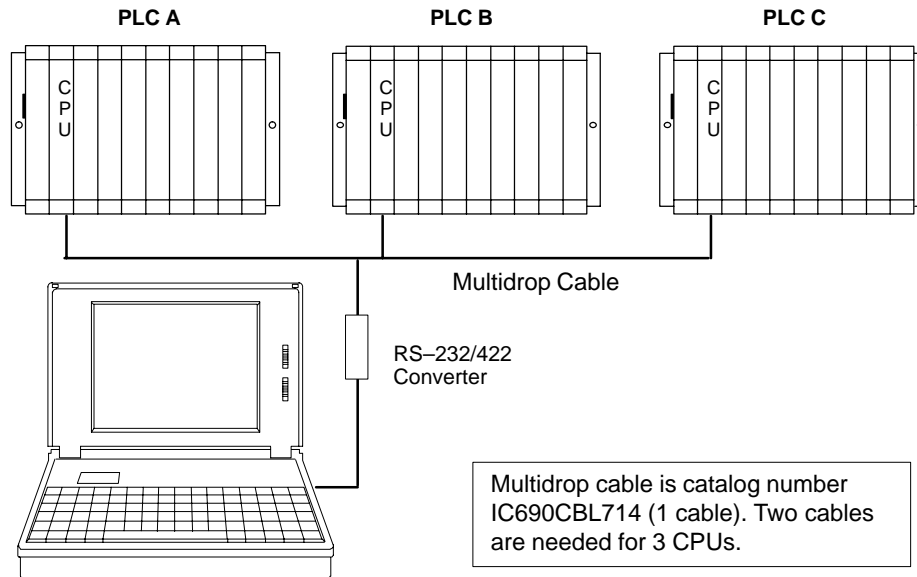1 Mbyte Memory, for IC66* Triple Modular Redundancy Systems**

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Figure 3. System Configuration, Serial Connection to Programmer

Serial Port

The 15-pin D-connector provides the connection to an RS-485 compatible serial port on the CPU (see Figure 3). This port provides a serial connection to a Work Station Interface board installed in the programming computer.

The serial connection can also be made from the serial port on the CPU to the serial port on the programming computer, or other serial device, through the RS-422/RS-485 to RS-232 Converter (IC690ACC900) or RS-232 to RS-422 Miniconverter (IC690ACC901). This connection can be made with available cables or you may build cables to fit the needs of your particular application. See reference 3 for more information on serial communications.

For more detailed information on configuration of TMR systems and communications between PLCs in the system, refer to the *Modular Redundancy Flexible Triple Modular Redundant (TMR) System User's Manual.*

Programmer Connection, Ethernet TCP/IP

Connecting your programmer via an Ethernet TCP/IP network requires installation of an Ethernet Interface module in the PLC. This can be either the Ethernet Controller, IC697CMM741, or Ethernet Interface (Type 2), IC697CMM742. Before connecting your programmer and PLC to the Ethernet TCP/IP network you must set the IP address in the Ethernet Interface. After setting the IP address, connect the PLC and the programmer running Windows software to the Ethernet Interface.

For more detailed information on Ethernet TCP/IP, refer to the *TCP/IP Ethernet Communications (Type 2) User's Manual,* and the Windows programming manual, GFK-1295.

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Configuration

The IC697 CPU and I/O system is configured with MS-DOS or Windows based programming software. There are no DIP switches or jumpers used to configure the system. The CPU verifies the actual module and rack configuration at power-up and periodically during operation. The actual configuration must be the same as the programmed configuration. Deviations are reported to the CPU alarm processor function for configured fault response. Consult Reference 1 for a description of configuration functions.

Battery

A lithium battery (IC697ACC701) is installed as shown in Figure 2. This battery maintains program and data memory when power is removed and operates the calendar clock. Be sure to install the new battery before removing the old battery. If during power-up diagnostics a low battery is detected, the *MODULE OK* LED (top LED) will not stay on. Specific indication of a low battery state is detailed in Reference 2.

Removing a Module

The instructions below should be followed when removing a module from its slot in a rack.

- Grasp the board firmly at the top and bottom of the board cover with your thumbs on the front of the cover and your fingers on the plastic clips on the back of the cover.

- Squeeze the rack clips on the back of the cover with your fingers to disengage the clip from the rack rail and pull the board firmly to remove it from the backplane connector.

- Slide the board along the card guide and remove it from the rack.

Table 1. References

Reference	Title
1	Programming Software User's Manual
2	Programmable Controller Reference Manual
3	Programmable Controller Installation Manual
4	IC660/IC661 Modular Redundancy Flexible Triple Modular Redundant (TMR) System User's Manual

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Table 2. Specifications for IC697CPM790 †

Battery	
Shelf life	10 years at 20° C (68° F)
Memory retention	6 months nominal without applied power.
Current required from 5V bus	3.3 Amps nominal
Operating Temperature	0 to 60°C (32°F to 140°F); *70 CFM forced air required* 0 to 40°C (32°F to 104°F); *without forced air*
Time of Day Clock accuracy	" 3.5 seconds per day maximum
Elapsed Time Clock (internal timing) accuracy	" .01% maximum
Serial Port	
RS422/485 compatible	Programmer Serial Attachment
VME	System designed to support the VME standard C.1

†   Refer to GFK-0867B, or later for product standards and general specifications.

Table 3. Ordering Information

Description	Catalog Number
Central Processing Unit 64 MHz, 32-Bit, Floating Point, 1 Mbyte Memory For IC66* Triple Modular Redundancy Systems	IC697CPM790
Lithium Battery	IC697ACC701
Rack Fan Assembly, 120 VAC Rack Fan Assembly, 240 VAC Rack Fan Assembly, 24 VDC	IC697ACC721 IC697ACC724 IC697ACC744

Note: For Conformal Coat option, or Low Temperature Testing option please consult the factory for price and availability.